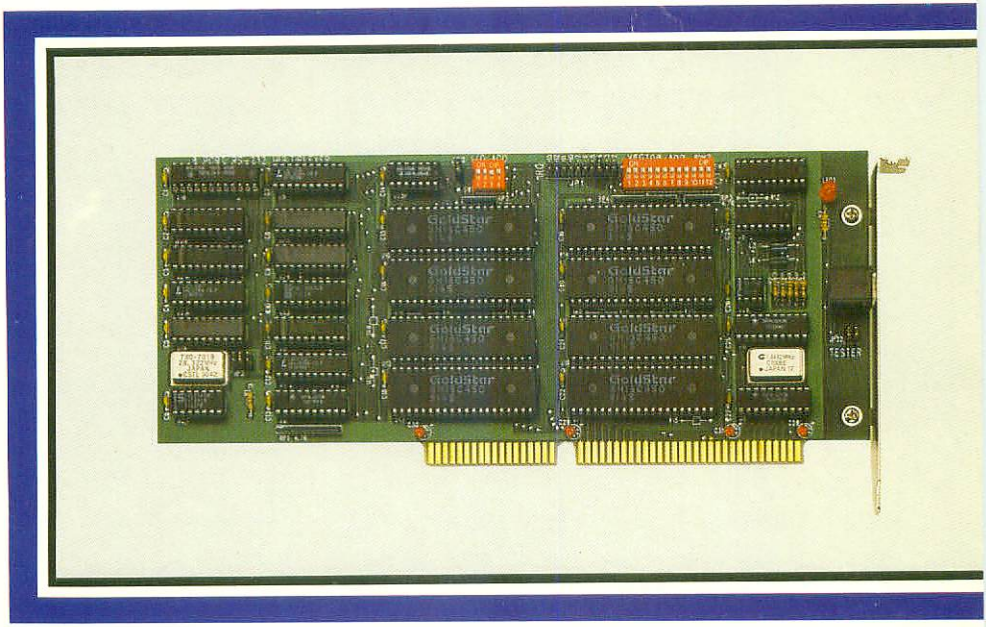
SAFLINE USER MANUAL
8 PORT MULTIPLEXER
SERIAL ADAPTER



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8 PORT MULTIPLEXER SERIAL ADAPTER

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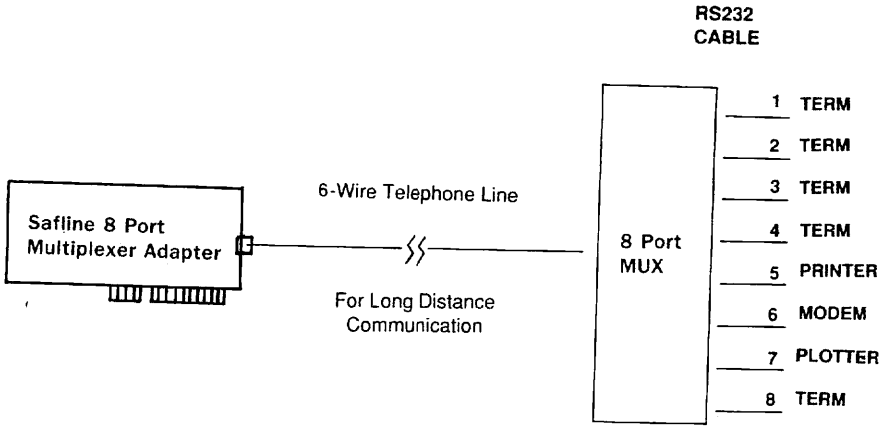
CHAPTER 1 INTRODUCTION

The SafLine 8 port multiplexer serial adapter provides eight asynchronous serial communication ports (RS232C), which transmits communication signal by using single 6 wire telephone line to remote 8 port multiplexer box, then the 8 port multiplexer box separate signals into 8 RS232 ports (DB25). The hardware configuration of 8 port multiplexer serial adapter and 8 port multiplexer box are shown in the belows. User may use this configuration to link the computer and serial peripheral devices such as modems, serial printers, plotters, etc.


RS232
CABLE
Safline 8 Port
Multiplexer Adapter
6-Wire Telephone Line
For Long Distance
Communication
8 Port
MUX
1 TERM
2 TERM
3 TERM
4 TERM
5 PRINTER
6 MODEM
7 PLOTTER
8 TERM

The advantages of using 8 port multiplexer serial adapter and 8 port multiplexer box is that when you construct the communication link from PC to peripheral devices, you only need use one inexpensive 6 wire telephone line to replace the eight RS232 cables, it extends communication distance and reduces cabling cost.

The SafLine 8 port multiplexer adapter is particularly suited to facilitate the connection of terminals (VDUs) in multi-user operating systems. Each package is supplied complete with multiplexer box containing eight female D25 connectors.

The SafLine multiplexer board may be installed in any IBM PC/AT, PC/386, PC/486 or hardware compatible system. To accommodate a variety of operating systems the switch banks permit maximum flexibility of configuration. You may select which interrupt (IRQ2 - IRQ15), I/O address, and interrupt vector you desire.

The features of the SafLine 8 port multiplexer adapter are:

* Eight RS232C ports for asynchronous communications.

* Suitable for XENIX/UNIX, PICK, MS/DOS, PC-MOS/386, CONCURRENT DOS, Dr. DOS, etc.

* IBM PC/AT, PC/386, PC/486 hardware compatible.

* ISA bus IRQ selectable. (IRQ2 - IRQ15)

* I/O address selectable.

* Interrupt vector address selectable.

* Only one 6 wire telephone line to replace eight RS232C asynchronous communication cables.

* Maximum transmission distance over 500M.

* Baud rate selectable for each individual port, and maximum baud rate up to 38400.

* Software handshaking (XON/XOFF) and hardware handshaking (RTS/CTS) selectable.

* Maximum data transfer rate on the communication line up to 200K.

* Time Division Multiplexing (TDM) method is used on the transmission protocol.

* Build in RJ-11 connector for communication line.

* Support DCE (Data Circuit terminating Equipment) and Tx, Rx, RTS, CTS signal.

* 120 VAC / 60 HZ or 230 VAC / 50HZ power which is auto switch.

CHAPTER 2 UNPACKING INFORMATION

Check that your SafLine package includes the following items:

* SafLine 8 port multiplexer adapter.
* SafLine 8 port multiplexer box.
* Power adapter
* User manual.
* PC COM software.
* Warranty form.

CHAPTER 3 SYSTEM REQUIREMENTS

Before installing your SafLine 8 port multiplexer adapter and 8 port multiplexer box, make sure that:

* The host computer is an IBM PC/AT, PC/386, PC/486 or compatible.

* The switch banks of multiplexer adapter are correctly configured to coincide with the operating system you are using.

* The operating system you intend to use is capable of driving multiple serial ports.

* The switch of multiplexer box is set corrected.

* Please refer the multiplexer box manual for detail installation.

CHAPTER 4 HARDWARE INSTALLATION

Your SafLine 8 port multiplexer adapter is designed to be inserted in any available slot in your PC/AT, PC/386, PC/486 or compatible. In order to gain access to the expansion slots, follow the steps listed below:

1. Turn off all power to your computer and all peripheral devices before installing your SafLine 8 port multiplexer adapter.

2. Remove the cover of the computer.

3. Insert the preconfigured SafLine 8 port multiplexer adapter into any available slot. Make sure the adapter is firmly seated in the chosen slot.

4. Replace the cover of the computer.

5. Route the 6 wire telephone line as desired, then plug RJ11 connector into both multiplexer box and multiplexer adapter. (The signal configuration is shown in the APPENDIX A.)

6. Connect 8 peripheral devices connector to multiplexer box.

7. Plug the power cable into wall outlet.

CHAPTER 5 SWITCH SETTINGS

5.1 Introduction

The two switch blocks and three jumpers on the SafLine 8 port adapter must be configured correctly in accordance with the operating system you are using.

SW1 (Switch 1)
Determines the address of the UARTs [I/O address].

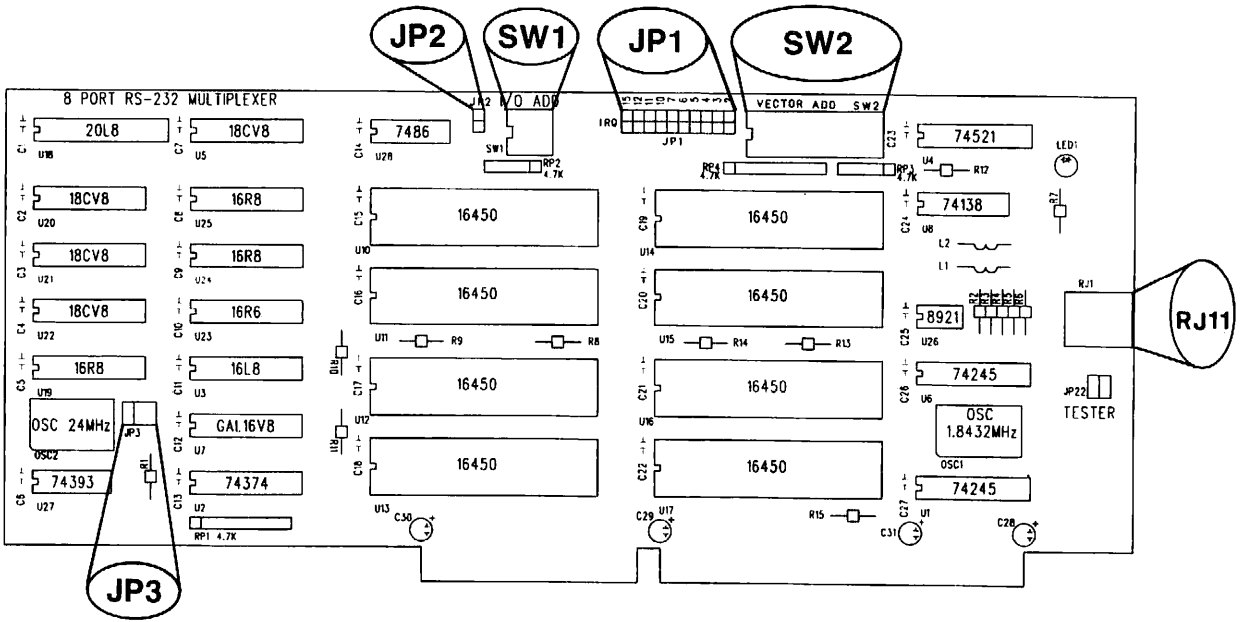
SW2 (Switch 2)
Selects the interrupt vector address and determines which port is active when an interrupt occurs.

JP1 (Jumper 1)
Selects which interrupt will be used in the range IRQ2 through IRQ15.

JP2 (Jumper 2)
Determines interrupt activation status.

JP3 (Jumper 3)
Determines maximum baud rate.

DECISION COMPUTER INTERNATIONAL CO., LTD.



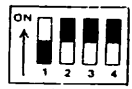
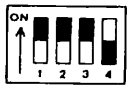
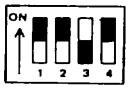
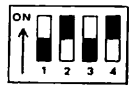
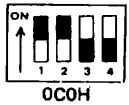
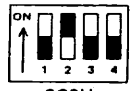
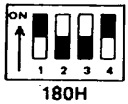
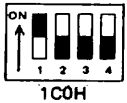
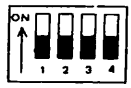
5.2 Selection of Switch Settings

It is important to refer to the user manual supplied with your operating system to determine the correct configuration. Although we provide installation advice for various operating systems, it is not possible to cover all systems in this user guide. Please contact your supplier if you have any difficulties with configuration.

IMPORTANT: CARE MUST BE TAKEN IN SELECTING THE CONFIGURATION OF SWITCHES TO ENSURE YOU DO NOT DUPLICATE SETTINGS OF OTHER EQUIPMENT ALREADY INSTALLED IN YOUR COMPUTER. DUPLICATION OF SETTINGS WILL RESULT IN A MALFUNCTION OF ONE OR BOTH DEVICES.

Please refer to the following settings for each switch block. If you are installing more than one board do not duplicate switch settings for any parameter.

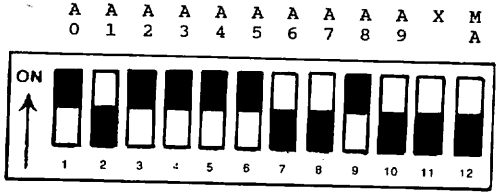
1. Switch 1 (I/O port address)

I/O PORT ADDRESS (UART ADDRESS)	SWITCH 1
000H	 200H
 040H	240H
 080H	 280H
 0C0H	 2C0H
100H	300H
140H	340H
 180H	380H
 1C0H	 3C0H

The I/O port address corresponding to each port are shown in the following.

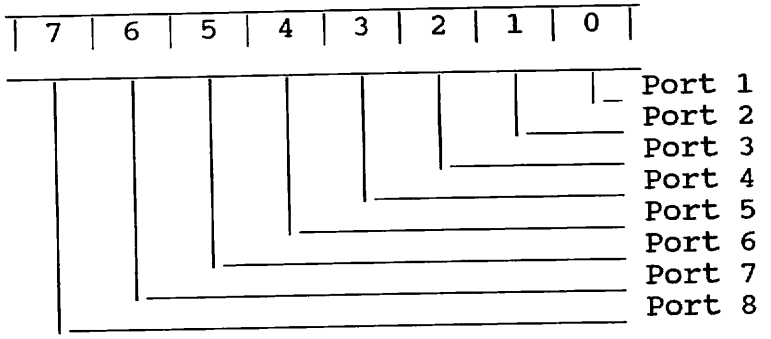
Port	Address
1	BASE to BASE+07H
2	BASE+08H to BASE+0FH
3	BASE+10H to BASE+17H
4	BASE+18H to BASE+1FH
5	BASE+20H to BASE+27H
6	BASE+28H to BASE+2FH
7	BASE+30H to BASE+37H
8	BASE+38H to BASE+3FH

2. Switch 2 (Interrupt vector address)



The SW2 is used to select interrupt vector address, the address is combined by (A9,A8,A7,A6,A5,A4,A3,A2,A1,A0). When the switch is set to off, it means 1, otherwise the switch is set to on, it means 0. The figure shown in above is set to 2C2H.

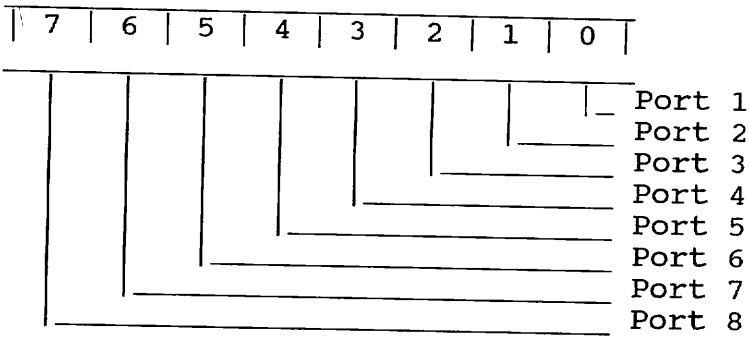
The interrupt vector address is used to detect which of the eight channels is creating the interrupt. The relationship between each port corresponds to the interrupt indicator as shown in the following. Suppose the activation status is low (which is selected by JP2), then when the corresponding bit is 0, an interrupt occurred, otherwise if the bit is 1, then no interrupt occurred.



User may read interrupt status from interrupt vector address.

The SW2-12 is used to enable/disable interrupt mask function. If it is set to off, means disable interrupt mask function, otherwise if it is set to on, means enable interrupt mask function. The interrupt mask register is used to mask interrupt occurs

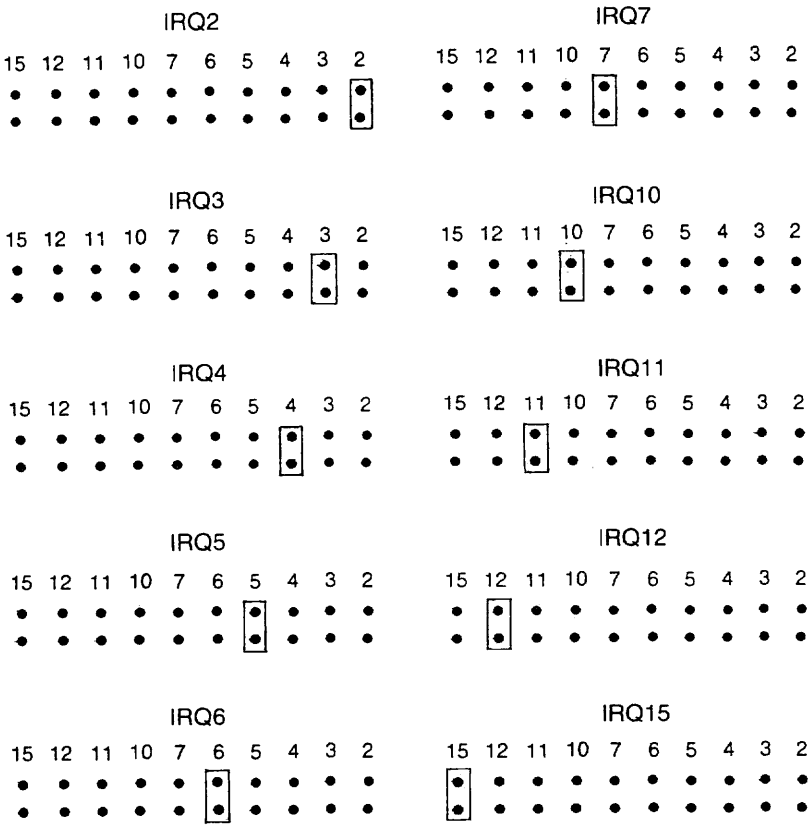
when the interrupt mask function is enable. The interrupt vector address is also used to represent as interrupt mask register. The relationship between each port corresponds to the interrupt mask indicator as shown in the following. If user need mask off interrupt of some channel, only clear (write 0) the corresponding bit.



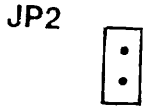
The default setting of the SW2-12 is set to off to disable interrupt mask function.

3. Jumper 1 (Interrupt)

INTERRUPT (IRQ) JUMPER 1



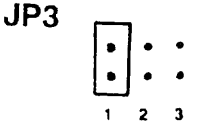
4. Jumper 2 (Interrupt activation status)



The JP2 is used to determine interrupt activation status, when the jumper is short, means low active, when the jumper is open, means high active. Please refer the interrupt vector address section more details.

JP2	activation status
on	low active
off	high active

5. Jumper 3 (Maximum baud rate)



JP3 is used to select maximum baud rate. If you select 9600 as the maximum baud rate, it means the baud rate of each 8 communication ports can not more than 9600; and you can set any baud rate below 9600 individually.

JP3	Baud Rate
1	38400
2	19200
3	9600

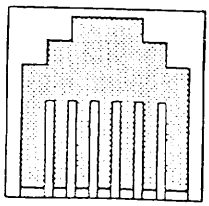
APPENDIX A CABLING INFORMATION

In this section, we will describe how to connect cables between multiplexer adapter and multiplexer box. You must sure the configurations are correct before you use the system.

First, we will show the configuration between multiplexer adapter and multiplexer box. Secondly, we will show the connection between multiplexer box and peripheral devices.

A.1 Telephone Line

The signal assignment of 6 wire telephone line is shown in the following.



Pin#	Description
1	Tx+
2	Tx-
3	GND
4	GND
5	Rx-
6	Rx+

To connect telephone line between multiplexer adapter and multiplexer box, please refer the following configuration.

Signal	Pin #		Pin	Signal
Tx+	1	→	6	Rx+
Tx-	2	→	5	Rx-
GND	3	—	3	GND
GND	4	—	4	GND
Rx-	5	←	2	Tx-
Rx+	6	←	1	Tx+

A.2 RS232 Signal Assignment

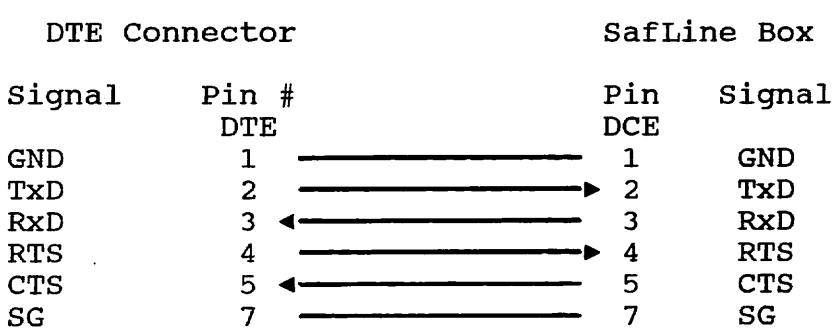
The communication interface follows the EIA RS232C standard. The signal assignments for a standard DB25 connector are shown below:

DB25 Pin #	Signal Name	RS-232C Name	Signal Direction
1	Chassis Ground(GND)	AA	Common
2	Transmit Data(TxD)	BA	Output
3	Receive Data(RxD)	BB	Input
4	Request to Send(RTS)	CA	Output
5	Clear to Send(CTS)	CB	Input
6	Data Set Ready(DSR)	CC	Input
7	Signal Ground(SG)	AB	Common
8	Data Carrier Detect(DCD)	CF	Input
20	Data Terminal Ready(DTR)	CD	Output
22	Ring Indicator(RI)	CE	Input

In SafLine 8 port multiplexer adapter, only Rx, Tx, RTS, and CTS are available. The signal assignment of SafLine multiplexer box is DCE, which is treated as MODEM device, and provides female DB25 connector. In the following, we show the DCE signal.

Female DB25 Pin #	Signal Name	RS-232C Name	Signal Direction
1	Chassis Ground(GND)	AA	Common
2	Transmit Data(TxD)	BA	Input
3	Receive Data(RxD)	BB	Output
4	Request to Send(RTS)	CA	Input
5	Clear to Send(CTS)	CB	Output
7	Signal Ground(SG)	AB	Common

To connect the SafLine 8 port multiplexer box to peripheral devices or the other DTE equipment, the DTE to DCE connection is shown below:



Please note that, you must connect DB25 connectors to multiplexer box correctly.

APPENDIX B SCO XENIX/UNIX CONFIGURATION

B.1 Device Mapping

1. Primary adapter

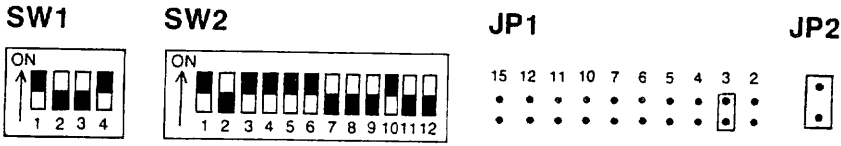
   Using primary adapter as COM1:
   I/O address is 100H
   Interrupt vector is 142H
   Interrupt is IRQ4

SW1 SW2 JP1 JP2

Port	Address	Device	Modem
1	100H	/dev/tty1a	/dev/tty1A
2	108H	/dev/tty1b	/dev/tty1B
3	110H	/dev/tty1c	/dev/tty1C
4	118H	/dev/tty1d	/dev/tty1D
5	120H	/dev/tty1e	/dev/tty1E
6	128H	/dev/tty1f	/dev/tty1F
7	130H	/dev/tty1g	/dev/tty1G
8	138H	/dev/tty1h	/dev/tty1H

2. Secondary adapter

Using secondary adapter as COM2:
I/O address is 180H
Interrupt vector is 1C2H
Interrupt is IRQ3



Port	Address	Device	Modem
1	180H	/dev/tty2a	/dev/tty2A
2	188H	/dev/tty2b	/dev/tty2B
3	190H	/dev/tty2c	/dev/tty2C
4	198H	/dev/tty2d	/dev/tty2D
5	1A0H	/dev/tty2e	/dev/tty2E
6	1A8H	/dev/tty2f	/dev/tty2F
7	1B0H	/dev/tty2g	/dev/tty2G
8	1B8H	/dev/tty2h	/dev/tty2H

Under the SCO XENIX operating system, the primary adapter is configured so that all ports interrupt on IRQ4. If a secondary adapter is used, it should be configured to interrupt IRQ3.

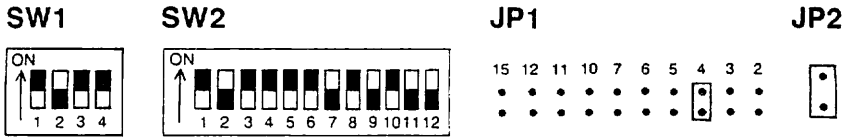
B.2 Installation For SCO XENIX

After the hardware configuration is set, please install the software drivers. The installation procedure is described as follows:

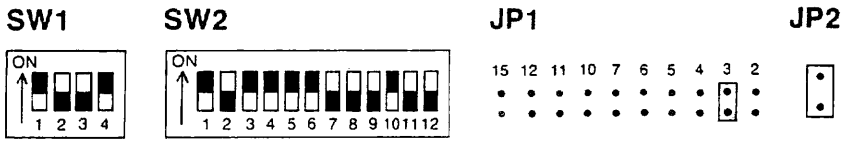
1. Select interrupt level

The first SafLine 8 port serial adapter should be strapped at interrupt 4 (COM1:). The second SafLine 8 port serial adapter should be set to IRQ3 which corresponds to COM2.

A. Primary adapter



B. Secondary adapter



2. Enter system maintenance mode

Boot the XENIX operating system then enter system maintenance mode.

3. Install serial port

Type

```
# mkdev serial
```

4. The screen will display:

```
You would like to install a
      1. 1 port card
      2. 2 port card
      3. 4 port card
      4. 5 port card
      5. 8 port card
Select an option or enter 'q' to quit:
```

Enter number 5 then press return.

5. The screen will display:

The card is configured as:
1. COM1
2. COM2
3. COM3
3. COM4
Select an option or enter 'h' for help or 'q' to quit:

Enter number 1 and press return, the system will configure eight serial ports for the primary adapter. These eight ports are tty1a, tty1b, tty1c, tty1d, tty1e, tty1f, tty1g, tty1h.

If you install a secondary adapter, repeat step 3 to 5 and enter number 2 to select the COM2 configuration. The system will then configure another eight serial ports: tty2a, tty2b, tty2c, tty2d, tty2e, tty2f, tty2g, tty2h.

6. Enable sixteen serial ports

Enable each serial port by using the

'enable' command. Please type

```
# enable tty1a
# enable tty1b
# enable tty1c
# enable tty1d
# enable tty1e
# enable tty1f
# enable tty1g
# enable tty1h
# enable tty2a
# enable tty2b
# enable tty2c
# enable tty2d
# enable tty2e
# enable tty2f
# enable tty2g
# enable tty2h
```

7. Connect each terminal to DB25 connector.

APPENDIX C DIAGNOSTICS UNDER MS/DOS

C.1 Diagnostic Under MS/DOS

The SUPER program provides a diagnostic routine to test your SafLine 8 port serial adapter under MS/DOS. It provides internal and external tests. A loopback plug must be connected to each port being tested. Pins 2 (TxD) and 3 (Rxd) must be shorted together in the plug.

To test your SafLine 8 port serial adapter under MS/DOS, please type

A>SUPER

(A> means system prompt)

the screen will display:

SUPER eight RS232C diagnostic.
Please make sure a loopback plug be connected!
Input delay cycle? (386=4000, AT=1000, XT=600)

For an XT, you may type a number larger than 600. For an AT or 386, you may type a number larger than 1000. The number is dependent on your machine cycle. If your machine cycle is very fast, type a larger number to synchronize the I/O speed of the 16450 chips.

C.2 PC COM Software

The PC COM software provides device drivers, library routines, and virtual terminal programs under MS/DOS. Please see PC COM software manual for more details.

APPENDIX D MULTILINK CONFIGURATION

Modify I/O port addresses by typing

mlcustom mlink.com

when the menu appears, select option 1 to change port addresses. Modify the I/O port addresses of your SafLine 8 port adapter as follows:

port 1	280H
port 2	288H
port 3	290H
port 4	298H
port 5	2A0H
port 6	2A8H
port 7	2B0H
port 8	2B8H

If an additional SafLine 8 port serial adapter is installed, then

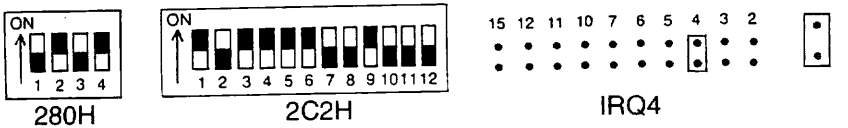
port 9	300H
port 10	308H
port 11	310H
port 12	318H
port 13	320H
port 14	328H
port 15	330H
port 16	338H

APPENDIX E PICK CONFIGURATION

Refer to PICK user installation guide for more information. If selecting IRQ3 or IRQ4 be sure to disable existing COM1 or COM2 ports.

1. First adapter

SW1 SW2 JP1 JP2



280H 2C2H IRQ4

2. Second adapter

SW1 SW2 JP1 JP2

180H 1C2H IRQ3

3. Third adapter

SW1 SW2 JP1 JP2

100H 142H IRQ7

4. Fourth adapter

SW1 SW2 JP1 JP2

200H 242H IRQ2

APPENDIX F CONCURRENT DOS CONFIGURATION
MULTI-USER (DR.) DOS CONFIGURATION

Set I/O port address to 280H, interrupt to IRQ3, and interrupt vector to 272H.

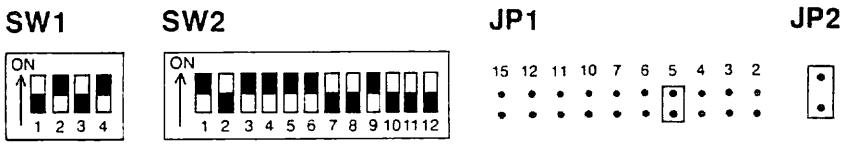
For multi-user DOS (Dr. DOS) configuration, please set I/O port address to 280H, and interrupt vector to 272H. Any interrupt (IRQ3 to IRQ15) is used.

APPENDIX G PC/MOS 386 CONFIGURATION

G.1 Hardware Configuration

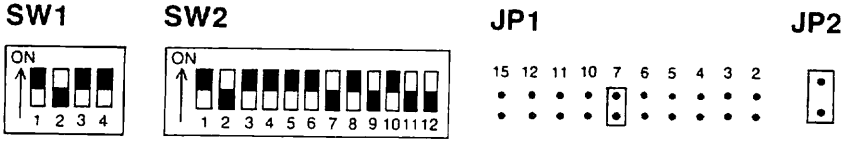
You may set arbitrary I/O addresses, interrupt, and interrupt vectors. However, we suggest you use as follows:

I/O port address = 280H
Interrupt = IRQ5
Interrupt vector = ANY ADDRESS



If an additional SafLine 8 port adapter is installed, then set

I/O port address = 100H
Interrupt = IRQ7
Interrupt vector = ANY ADDRESS



G.2 Software Installation

We assume the eight I/O port addresses are 280H, 288H, 290H, 298H, 2A0H, 2A8H, 2B0H, and 2B8H. The interrupt is set to IRQ5. We also assume your PC-MOS/386 can support more than 9 users.

a. Prepare CONFIG.SYS file

The contents of CONFIG.SYS includes

```
DEVICE = 52TERM.SYS
DEVICE = $SERIAL.SYS  /AD=280,HS=X,IN=5 ~
                      /AD=288,HS=X,IN=5 ~
                      /AD=290,HS=X,IN=5 ~
                      /AD=298,HS=X,IN=5 ~
                      /AD=2A0,HS=X,IN=5 ~
                      /AD=2A8,HS=X,IN=5 ~
                      /AD=2B0,HS=X,IN=5 ~
                      /AD=2B8,HS=X,IN=5
```

There are several serial device drivers supported by PC-MOS/386. You must select the device driver according to the terminal type connected. In this example, we use a VT52 as the terminal device. The following device drivers are supported by PC-MOS/386.

PCTERM:
For PC type terminals, Ampex 232, Emulink software, Falco 5500, Kimtron KT-7

PC, Link Technologies MC1, MC3 and PCterm, Televideo PCS1, and Wyse Wy-60.

TTTERM:
For Teletype type terminals.

AVTERM:
For ADDS Viewpoint type terminals.

3ATERM:
ADM 3A.

T1TERM:
Televideo 910.

52TERM:
DEC VT-52.

31TERM:
IBM 3101.

19TERM:
Zenith Z-19.

TVTERM:
Televideo 912C, 920C, 925.

EXTERM:
Excel 42/44.

ANTERM:
ANSI terminals.

After the device driver is declared, you must enter your I/O port addresses,

handshaking protocol, and interrupt. In this example, I/O port addresses are 280H, 288H, 290H, 298H, 2A0H, 2A8H, 2B0H, and 2B8H, and handshaking protocol is set to X (receiver controlled on and off). Interrupt level is set to IRQ5. Where '~' tells MOS that the next line is a continuation of the attributes. We explain each parameter setting in the following:

AD= : the port address.
HS= : handshaking protocol, can be set to
N - None.
D - DTR.
X - XOFF.
P - XPC.
R - results in DTR, XPC, and RTS.
IN= : interrupt level.

b. Prepare AUTOEXEC.BAT file

The contents of AUTOEXEC.BAT file includes

```
ADDTASK 32K,1,,TTY1,52TERM,1,9600
ADDTASK 32K,2,,TTY2,52TERM,2,9600
ADDTASK 32K,3,,TTY3,52TERM,3,9600
ADDTASK 32K,4,,TTY4,52TERM,4,9600
ADDTASK 32K,5,,TTY5,52TERM,5,9600
ADDTASK 32K,6,,TTY6,52TERM,6,9600
ADDTASK 32K,7,,TTY7,52TERM,7,9600
ADDTASK 32K,8,,TTY8,52TERM,8,9600
MOS SERINIT 1,9600,N,8,1
```

```
MOS SERINIT 2,9600,N,8,1
MOS SERINIT 3,9600,N,8,1
MOS SERINIT 4,9600,N,8,1
MOS SERINIT 5,9600,N,8,1
MOS SERINIT 6,9600,N,8,1
MOS SERINIT 7,9600,N,8,1
MOS SERINIT 8,9600,N,8,1
```

If you have multi-user capability, you must use the ADDTASK command to create user partitions. The ADDTASK command may be included in the AUTOEXEC.BAT file to add users when you boot the computer automatically. The syntatic specification of ADDTASK is:

```
ADDTASK memsizeK,{task ID},{class},{startup},
        term ID,port,baud rate
```

memsize :

Enter the amount of memory you want to allocate to the user, it must be at least 32K. The memory size should be large enough to facilitate whatever applications are to be run in the partition.

task ID :

Enter up to two digits for the task number to assign to the partition. Zero is reserved for the partition in base memory.

class :

Enter the security class.

startup :
enter up to eight characters for the name of a startup batch file for the task.

term ID :
Enter device driver name, which is specified in the step a.

port :
Enter the number of the serial port to which a terminal for this partition is connected.

baud rate :
Enter the baud rate for the serial port.

In this example, we add eight serial ports in the system and each memory partition occupies 32K bytes of memory. When we turn on the first terminal (I/O port address 280H), it will run the auto execution file which is TTY1.BAT. The task ID of the first terminal is 1.

After we create a user partition with the ADDTASK command, we must set the communication parameters for the serial ports. The MOS SERINIT command is used to specify communication parameters, which are described as follows:

```
MOS SERINIT n,r,p,b,s

n - the I/O port number.
r - the baud rate.
p - the parity may be N(None), E(Even), or
    O(Odd).
b - the number of data bits.
s - the number of stop bits.
```

In this example, we set no parity, baud rate = 9600, 8 data bits, and 1 stop bit.

G.3 Terminal Setup

Suppose you use PC and VTERM software to emulate VT52, you must press CTRL \ (which represents ESC), then press B, which will refresh the bottom 24 lines (lines 2 through 25) of the display on the video screen of a terminal. Otherwise, your cursor may disappear.

APPENDIX H IBM XENIX CONFIGURATION

H.1 Hardware Configuration

Under the IBM XENIX operating system, a maximum of four adapters can be added to the PC/AT, PC/386, or compatible to provide thirty two ports. The hardware configuration is shown in the following:

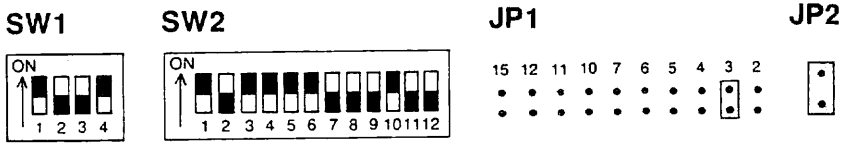
1. first adapter

I/O port address: 280H
Interrupt level : IRQ4
Interrupt vector: 2C2H

port	device name
1	/dev/tty02
2	/dev/tty03
3	/dev/tty04
4	/dev/tty05
5	/dev/tty06
6	/dev/tty07
7	/dev/tty08
8	/dev/tty09

2. second adapter

I/O port address: 180H
Interrupt level : IRQ3
Interrupt vector: 1C2H



port	device name
1	/dev/tty12
2	/dev/tty13
3	/dev/tty14
4	/dev/tty15
5	/dev/tty16
6	/dev/tty17
7	/dev/tty18
8	/dev/tty19

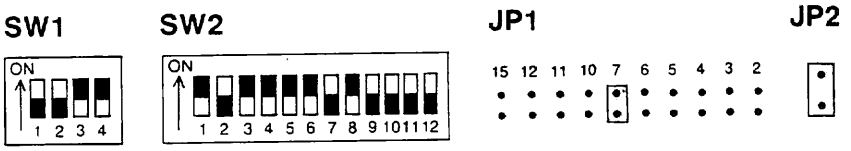
3. third adapter

I/O port address: 100H
Interrupt level : IRQ5
Interrupt vector: 142H

port	device name
1	/dev/tty22
2	/dev/tty23
3	/dev/tty24
4	/dev/tty25
5	/dev/tty26
6	/dev/tty27
7	/dev/tty28
8	/dev/tty29

4. fourth adapter

I/O port address: 300H
Interrupt level : IRQ7
Interrupt vector: 342H



port	device name
1	/dev/tty32
2	/dev/tty33
3	/dev/tty34
4	/dev/tty35
5	/dev/tty36
6	/dev/tty37
7	/dev/tty38
8	/dev/tty39

H.2 Installation For The IBM XENIX Operating System

The installation procedure for the device drivers is described as follows:

1. Login as a root user.

2. Create a temporary directory and change default to this directory. Please type

```
# mkdir   /usr/temp
# cd      /usr/temp
```

(where # is the system prompt)

3. Insert distribution diskette (which contains device drivers) into floppy disk drive A:, then copy the files from the distribution diskette to a temporary directory.

Step 1: Copy batch file to /usr/temp, please type

```
#doscp -r A:/copy .
#chmod 0755 copy
```

Step 2: Copy device drivers to the temporary directory, please type

#./copy

4. To install device drivers, please type:

./setup

The setup program will ask you

How many adapters are installed (1,2,3,4):

After you answer, the system will take about four minutes to install the device drivers. After installation, the old kernel is renamed as XENIX.SAVE, and the new system kernel is installed as XENIX.

5. Reboot the system. Now, your new XENIX system which includes device drivers is activated.

6. Enable each terminal by using the enable command. Please type

```
# enable  /dev/tty02
# enable  /dev/tty03
          .
          .
          .
          .
# enable  /dev/tty39
```

7. Connect each terminal to DB25 connector.

NOTE: If the new system fails to reboot, boot the original system using the command:

```
# hd /XENIX.SAVE
```

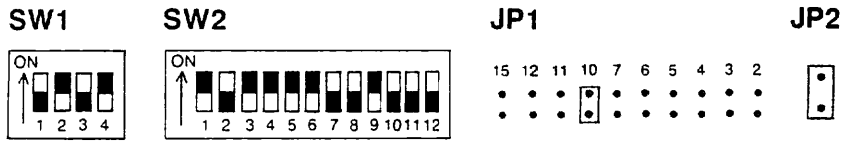
APPENDIX I AT&T UNIX CONFIGURATION INTERACTIVE UNIX CONFIGURATION

I.1 Hardware Configuration

For AT&T UNIX and INTERACTIVE UNIX, the special device drivers are provided on the distribution diskette. The hardware configurations are shown in the following.

1. first adapter

I/O port address: 280H
Interrupt level : IRQ10
Interrupt vector: 2C2H



port	device name	MODEM name
1	/dev/ttyj11	/dev/ttyJ11
2	/dev/ttyj12	/dev/ttyJ12
3	/dev/ttyj13	/dev/ttyJ13
4	/dev/ttyj14	/dev/ttyJ14
5	/dev/ttyj15	/dev/ttyJ15
6	/dev/ttyj16	/dev/ttyJ16
7	/dev/ttyj17	/dev/ttyJ17
8	/dev/ttyj18	/dev/ttyJ18

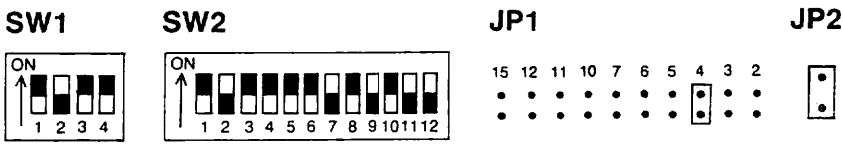
2. second adapter

I/O port address: 240H
Interrupt level : IRQ12
Interrupt vector: 2D2H

port	device name	MODEM name
1	/dev/ttyj21	/dev/ttyJ21
2	/dev/ttyj22	/dev/ttyJ22
3	/dev/ttyj23	/dev/ttyJ23
4	/dev/ttyj24	/dev/ttyJ24
5	/dev/ttyj25	/dev/ttyJ25
6	/dev/ttyj26	/dev/ttyJ26
7	/dev/ttyj27	/dev/ttyJ27
8	/dev/ttyj28	/dev/ttyJ28

3. third adapter

I/O port address: 100H
Interrupt level : IRQ4
Interrupt vector: 142H



port	device name	MODEM name
1	/dev/ttyj31	/dev/ttyJ31
2	/dev/ttyj32	/dev/ttyJ32
3	/dev/ttyj33	/dev/ttyJ33
4	/dev/ttyj34	/dev/ttyJ34
5	/dev/ttyj35	/dev/ttyJ35
6	/dev/ttyj36	/dev/ttyJ36
7	/dev/ttyj37	/dev/ttyJ37
8	/dev/ttyj38	/dev/ttyJ38

4. fourth adapter

I/O port address: 180H
Interrupt level : IRQ3
Interrupt vector: 1C2H

port	device name	MODEM name
1	/dev/ttyj41	/dev/ttyJ41
2	/dev/ttyj42	/dev/ttyJ42
3	/dev/ttyj43	/dev/ttyJ43
4	/dev/ttyj44	/dev/ttyJ44
5	/dev/ttyj45	/dev/ttyJ45
6	/dev/ttyj46	/dev/ttyJ46
7	/dev/ttyj47	/dev/ttyJ47
8	/dev/ttyj48	/dev/ttyJ48

I.2 Software Installation

The installation procedure for the device drivers is described as follows:

1. Login as a root user.

2. Backup original UNIX kernel, please type

```
# cd /
# cp /unix  /unix.bck
```

3. Insert distribution diskette (which contains device drivers) into floppy disk drive A:, then copy the files from the distribution diskette to a temporary directory.

```
#tar xvf /dev/fd048ds9 ./PC_COM
```

4. To install device drivers, please type:

```
# cd /PC_COM
# sh setup
```

The setup program will ask you

1. How many adapters are installed.
2. Which IRQ are selected.
3. Communication parameters.

After answer the above questions, then the script will prompt you with:

The UNIX Operating System will now be rebuilt. Please wait ...

5. Reboot the system. Now, your new UNIX system which includes device drivers is activated.

6. Enable each terminal by using the entty command. Please type

```
# entty   ttyj11
# entty   ttyj12
        .
        .
        .
        .
```

7. Connect each terminal to DB25 connector.

NOTE

1. If the new system fails to reboot, please boot the original system. For interactive UNIX, when system is boot, please press return key to halt autoboot, then type

```
# unix.bck
```

For AT&T UNIX, please modify AUTOBOOT=NO parameter from /etc/default/boot file, then type

```
# unix.bck
```

Please note that, before you install your distribution disk, you need modify AUTOBOOT parameter.

2. To remove device driver from UNIX, please type

```
# cd /PC_COM
# sh remove
```

3. After installation, please enable each port by entty command and disable port by distty command.

4. To change baud rate, please update /etc/inittab and /etc/conf/cf.d/init.base files.

5. To use local printer (connect auxiliary port from terminal), please check your terminal manual to send leading code to control your terminal to bypass data to printer.

APPENDIX J FIFO CHIPS FOR MULTI-USER DOS

To use the FIFO chips and FIFO driver under multi-user DOS (Dr. DOS), please note us for extra charge. The DRMDOS driver provides up to 2 cards in the system. It uses the external driver (generic) to drive 16550 chips with FIFO. Before use the DRM16.SYS driver, please insert protect key (dongles) into your printer adapter.

The communication protocol are

1. None
2. XON/XOFF
3. DTR/DSR
4. CTS/RTS

The installation procedures are shown in the following.

1. Copy DRM16.SYS file from distribution disk into /OSUTILS directory.

```
C:> copy A:DRM16.SYS C:\OSUTILS
```

2. Add command into CConfig.SYS file.

```
DEVICE=C:\OSUTILS\DRM16.SYS/Mxxx,yyy/Sxxx,
yyy/In,m
```

M	for master board
S	for second board
I	for IRQ
xxx	for I/O port address (Hex)
yyy	for interrupt vector (Hex) [the driver add 2 automatically]
n	IRQ2 to IRQ15 for master board
m	IRQ2 to IRQ15 for second board

The default setting is

/M180,1C0/S280,2C0/I5,5

Please note that, the interrupt vector address that you specify in the CConfig.sys will be added 2 automatically, so that you must set the hardware carefully. Suppose the default setting is 280, then you must set 282 in the board.

Do not set the same IRQ to different adapters, the default setting is used to daisy chain connector. In this board, we do not provide daisy chain function.

3. To use setup program to setup serial ports. The setup program is provides from multi-user DOS. please note that, you must select

    1. Generic (own driver)
    2. 16 ports
    3. PC terminal

when you setup system.

APPENDIX K FIFO CHIPS FOR UNIX

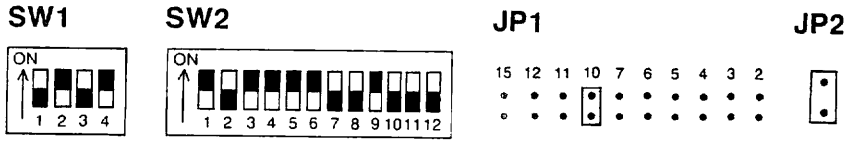
To use the FIFO chips and FIFO driver under UNIX/XENIX operating system, please note us for extra charge. The UNIX/XENIX drivers are used to drive 16550 chips with FIFO. Before use the device driver, please insert protect key (dongles) into your printer adapter.

We provides SCO, AT&T, and INTERACTIVE UNIX/XENIX drivers in the distribution disk. For UNIX system, the hardware configuration and software installation procedures are the same as APPENDIX I, please refer it.

For SCO XENIX system, the hardware configuration is shown in the below and the software installation procedure is the same as APPENDIX I.

1. first adapter

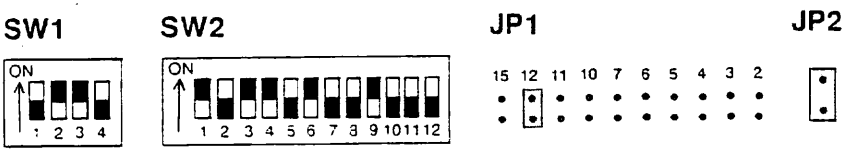
I/O port address: 280H
Interrupt level : IRQ10
Interrupt vector: 2C2H



port	device name	MODEM name
1	/dev/ttyj11	/dev/ttyJ11
2	/dev/ttyj12	/dev/ttyJ12
3	/dev/ttyj13	/dev/ttyJ13
4	/dev/ttyj14	/dev/ttyJ14
5	/dev/ttyj15	/dev/ttyJ15
6	/dev/ttyj16	/dev/ttyJ16
7	/dev/ttyj17	/dev/ttyJ17
8	/dev/ttyj18	/dev/ttyJ18

2. second adapter

I/O port address: 240H
Interrupt level : IRQ12
Interrupt vector: 2D2H



port	device name	MODEM name
1	/dev/ttyj21	/dev/ttyJ21
2	/dev/ttyj22	/dev/ttyJ22
3	/dev/ttyj23	/dev/ttyJ23
4	/dev/ttyj24	/dev/ttyJ24
5	/dev/ttyj25	/dev/ttyJ25
6	/dev/ttyj26	/dev/ttyJ26
7	/dev/ttyj27	/dev/ttyJ27
8	/dev/ttyj28	/dev/ttyJ28

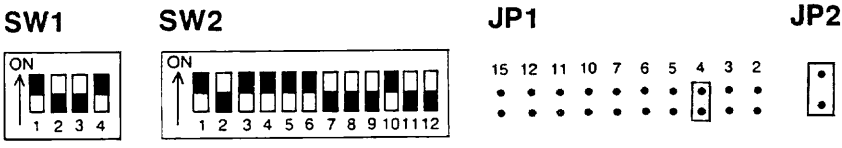
3. third adapter

I/O port address: 100H
Interrupt level : IRQ3
Interrupt vector: 142H

port	device name	MODEM name
1	/dev/ttyj31	/dev/ttyJ31
2	/dev/ttyj32	/dev/ttyJ32
3	/dev/ttyj33	/dev/ttyJ33
4	/dev/ttyj34	/dev/ttyJ34
5	/dev/ttyj35	/dev/ttyJ35
6	/dev/ttyj36	/dev/ttyJ36
7	/dev/ttyj37	/dev/ttyJ37
8	/dev/ttyj38	/dev/ttyJ38

4. fourth adapter

I/O port address: 180H
Interrupt level : IRQ4
Interrupt vector: 1C2H



port	device name	MODEM name
1	/dev/ttyj41	/dev/ttyJ41
2	/dev/ttyj42	/dev/ttyJ42
3	/dev/ttyj43	/dev/ttyJ43
4	/dev/ttyj44	/dev/ttyJ44
5	/dev/ttyj45	/dev/ttyJ45
6	/dev/ttyj46	/dev/ttyJ46
7	/dev/ttyj47	/dev/ttyJ47
8	/dev/ttyj48	/dev/ttyJ48

To enable the I/O port under SCO operating system, please use enable command which is provided by SCO system (DO NOT USE entty COMMAND which is used under AT&T and INTERACTIVE UNIX). Also use disable command to disable the I/O port under SCO operating system.

APPENDIX L WARRANTY INFORMATION

L.1 Copyright

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Each piece of SafLine package permits user to use SafLine only on a single computer, a registered user may use the program on a different computer, but may not use the program on more than one computer at the same time.

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L.2 Warranty Information

SafLine warrants that for a period of one year from the date of purchase (unless otherwise specified in the warranty card) that the goods supplied will perform according to the specifications defined in the user manual. Furthermore that the SafLine product will be supplied free from defects in materials and workmanship and be fully functional under normal usage.

In the event of the failure of a SafLine product within the specified warranty period, SafLine will, at its option, replace or repair the item at no additional charge. This limited warranty does not cover damage resulting from incorrect use, electrical interference, accident, or modification of the product.

All goods returned for warranty repair must have the serial number intact. Goods without serial numbers attached will not be covered by the warranty.

Transportation costs for goods returned must be paid by the purchaser. Repaired goods will be dispatched at the expense of SafLine.

To ensure that your SafLine product is covered by the warranty provisions, it is necessary that you return the Warranty card.

Under this Limited Warranty, SafLine's obligations will be limited to repair or replacement only, of goods found to be defective as specified above during the warranty period. SafLine is not liable to the purchaser for any damages or losses of any kind, through the use of, or inability to use, the SafLine product.

SafLine reserves the right to determine what constitutes warranty repair or replacement.

Return Authorization: It is necessary that any returned goods are clearly marked with an RA number that has been issued by SafLine. Goods returned without this authorization will not be attended to.

NOTE: